

## RIVERS AND FLOODS

By MONTROSE W. HAYES

[In charge River and Flood Division]

Elsewhere in this issue there is an article which discusses all the floods of the United States during the last four months except that in the Columbia River of Oregon and Washington. The Columbia River passed above

flood stage in May, but had not receded at the end of June; and information concerning it is not complete. It will be discussed in a later issue of the REVIEW.

## WEATHER OF THE ATLANTIC AND PACIFIC OCEANS

[The Marine Division, W. F. McDonald in charge]

## NORTH ATLANTIC OCEAN

By W. F. McDONALD

*Atmospheric pressure.*—Average values of daily barometric observations at land stations representing the Atlantic area during June 1933 were for the most part within one tenth of an inch of normal. The greatest deficiency was only 0.12 inch, at Bermuda and also at Reykjavik. The Azores HIGH was somewhat above normal, but the largest excess, 0.10 inch, was reported from the Shetland Islands. (See table 1.)

The extreme range of pressures reported by ships on the trans-Atlantic routes was from 29.33 to 30.59 inches, the lower reading from the American S.S. *Quaker City*, near 59° N. 19° W. on the 4th, and the higher reading from the American S.S. *Sahale*, near 42° N. 40° W. on the 16th. The lowest reported from tropical as well as extratropical Atlantic waters during June was 29.00 inches from the American tanker *Eastern Sun*, at 16° 27' N., 76° 15' W., on the last day of the month. This low barometer occurred in connection with the passage of a tropical disturbance through the Caribbean Sea, noted below.

TABLE 1.—Averages, departures, and extremes of atmospheric pressure (sea level) at selected stations for the North Atlantic Ocean and its shores, June 1933

Stations	Average pressure	Departure	Highest	Date	Lowest	Date
	<i>In.</i>	<i>In.</i>	<i>In.</i>		<i>In.</i>	
Julianehaab, Greenland.....	29.71	—	29.96	18, 23	29.18	3
Reykjavik, Iceland.....	29.76	—0.12	30.24	25	29.24	5
Lerwick, Shetland Islands.....	29.90	+0.10	30.34	9	29.09	17
Valencia, Ireland.....	29.95	—0.05	30.48	10	29.43	20
Lisbon, Portugal.....	30.04	+0.01	30.21	23	29.94	6, 12
Madeira.....	30.11	+0.04	30.23	27	30.01	7, 13
Horta, Azores.....	30.32	+0.08	30.48	16	30.06	1
Belle Isle, Newfoundland.....	29.83	—0.01	30.36	18	29.20	2
Halifax, Nova Scotia.....	29.89	—0.08	30.18	25	29.66	13
Nantucket.....	29.91	—0.07	30.19	24	29.65	30
Hatteras.....	29.96	—0.05	30.20	15	29.71	13
Bermuda.....	30.01	—0.12	30.26	29	29.76	2, 3
Turks Island.....	29.97	—0.06	30.06	25, 30	29.86	1, 2
Key West.....	29.98	—0.03	30.10	25	29.77	1
New Orleans.....	30.00	+0.02	30.16	15	29.76	23
Cape Gracias, Nicaragua.....	29.85	—0.02	29.90	25, 29, 30	29.80	1, 17, 20

NOTE.—All data based on a.m. observations only, with departures compiled from best available normals related to time of observation, except Hatteras, Key West, Nantucket, and New Orleans, which are 24-hour corrected means.

*Extratropical cyclones and gales.*—Moderate to fresh gales were fairly widespread on the 1st, 2d, and 3d, between New York and the Irish coast. At this time vigorous but not unusually intense cyclonic depressions, along the American coast and over high latitudes, intensified the barometric gradient on the north side of a well-developed high-pressure area that dominated the region between Bermuda and Gibraltar. (See chart VIII.)

Gales of force 8 to 9 were again reported over the middle and eastern parts of the main steamer lanes on the 18th and 19th. The Azores were then under the influence of

the strongest high-pressure area of the month, and these winds appear to have been due to that factor as much as to any cyclonic activity.

In fact the most remarkable feature of the month's weather on the Atlantic was the persistent and quite intense character of the Atlantic HIGH, which maintained uninterrupted dominance over the region between the Azores and Africa, and frequently extended its influence to high latitudes.

Apart from these two brief periods of gales at the beginning and shortly after the middle of the month, very few gales were encountered in extratropical latitudes, although the highest wind reported, which was of storm force (Beaufort 11), occurred near Long Island, on the 10th; this was described in the report as a violent thunder squall.

Most unusual gale conditions, not so far identified as to probable cause, were observed by the Belgian steamship *Persier* on the 26th and 27th while en voyage from Rio to Antwerp, between 9° and 15° N., and near longitude 25° W. The strong winds began from the west, and on the 26th attained a force of 7 from that direction, but the accompanying barometer was about normal, at 29.86 inches. On the 27th the winds came around to the usual direction of the trades, and blew strongly from the northeast, reaching the force of a gale (8) from east-northeast, with the barometer slightly higher than on the previous day. It is of interest to note that at the time these unusual winds were observed 2,000 miles east of Trinidad, a tropical disturbance was starting near the same latitude off the coast of South America, as described below.

*Tropical cyclone.*—A tropical disturbance originated a few days before the close of the month at an undetermined position over the waters north of Guiana. It was first disclosed on the morning of the 27th by a radiogram from the Brazilian steamship *Jaboatão*, reporting an easterly gale with barometer 29.27 inches, near 10° N. 59° W. This storm passed just south of Trinidad on the same afternoon, doing considerable damage there, and at 8 p.m. of that same day the American tanker *E. J. Bullock*, in the Gulf of Paria, reported a north wind of force 11, barometer 29.12, showing the storm to be fully developed, though of small extent.

The first report from a ship to reveal winds of full hurricane intensity came from the American tanker *Gulfcrest*, which was overtaken by the hurricane at 6 a.m. of the 29th, near 13° N. 70° W.; wind, SE, 12; barometer, 29.10 inches. The American tanker *Eastern Sun* was close to the center of the cyclone at 3 p.m. of the 30th, near 16° N. 76° W., where hurricane winds backed from north through west to south, and the barometer fell to 29 inches, its lowest value. That the area of hurricane winds was still of small diameter at that position is shown by reports from the American steamers *Mobile City* and *Minnesotan*, each of which had only a strong easterly gale, while the *Eastern Sun*, not more than 50 miles away, was under stress of the hurricane center.

This hurricane moved steadily northwestward after the end of June, entered the Gulf of Mexico, and turned westward to the Mexican coast a short distance south of the mouth of the Rio Grande, where it crossed the coastline and disappeared, July 6th.

A fuller discussion of this hurricane will appear in the July REVIEW.

**Fog.**—June was, as usual, a bad month for fog over the northern part of the Atlantic. Foginess was reported on more than half the days of the month in several 5° squares between the Grand Banks and Cape Hatteras; on 7 to 13 days over the middle portion of the routes eastward to the 30th meridian and north of the 40th parallel; and on a few days in the region east of that meridian. Fog was reported on 1 or 2 days over mid-ocean between 35° and 40° N., and also on 2 days near the American coast southeast of Hatteras, below latitude 35°.

**Trans-Atlantic aviation.**—Two noteworthy airplane crossings of the north Atlantic were successfully accomplished in June 1933. The first, in less than 24 hours, and establishing a speed record, was by the veteran American aviator James Mattern, who crossed from New York to a point near Oslo. Charts VIII and IX, for June 3 and 4, show the weather conditions attending this flight.

On June 11th two officers of the Spanish Army—Captain Barberan and Lieutenant Collar—took off from Tablada, Spain, with their objective a nonstop flight to Cuba. They landed on June 12 at Camaguey, having successfully completed the longest trans-Atlantic flight which so far has been made. Charts X and XI, for June 11 and 12 are presented to show the conditions attending this extraordinary venture.

It is noted with regret that these courageous flyers were lost a few days later on their further attempt to cross the Gulf of Mexico from Habana to Mexico City.

## OCEAN GALES AND STORMS, JUNE 1933

Vessel	Voyage		Position at time of lowest barometer		Gale began	Time of lowest barometer	Gale ended	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Direction and highest force of wind	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
NORTH ATLANTIC OCEAN													
Independence Hall, Am. S.S.	New York	Le Havre	40 22 N	70 20 W	June 1	Noon, June 1	June 1	Inches 29.70	NNE	NE, 7	NE	NE, 8	Steady.
Washington, Am.S.S.	Port Arthur	New York	35 28 N	75 12 W	do	do	do	29.70	N	N, 8	NE	N, 8	N-NE.
Elmsport, Am.S.S.	New Orleans	Bremen	46 05 N	29 40 W	May 31	6 p., 1	June 2	29.60	NW	NW, 8	NW	NW, 8	Steady.
Livenza, Ital.S.S.	Gibraltar	New York	41 15 N	54 26 W	June 2	10 a., 2	do	29.67	SW	SW, 8	N	SW, 8	SW-N.
Black Tern, Am.S.S.	Antwerp	Baltimore	49 31 N	26 09 W	June 3	8 p., 3	June 5	29.49	SW	SW, 7	WNW	W, 9	SSW-SW-W.
Quaker City, Am.S.S.	Dundee	Boston	58 07 N	16 10 W	do	10 p., 3	June 4	29.67	S	—, 7	S	S, 9	NW-W.
Excelsior, Am.S.S.	Casablanca	do	39 36 N	49 00 W	June 7	12 midt, 7	June 8	29.77	SW	SW, 8	NNW	SW, 8	SW-NNW.
Statendam, Du.S.S.	New York	Rotterdam	40 27 N	72 45 W	June 10	4 a., 10	June 10	29.77	S	NW, 11	W	NW, 11	Var.
Caledonia, Br.S.S.	Glasgow	New York	55 30 N	8 00 W	June 17	12mdt, 17	June 18	28.94	WNW	WNW, 9	NW	WNW, 9	Steady.
Liberty Glo, Am.S.S.	Antwerp	Charleston	49 24 N	6 27 W	June 18	6 a., 18	June 20	29.66	NW	NW, 7	WNW	—, 8	Do.
Mar Cantabrico, Span. M.S.	Heulva	Philadelphia	40 38 N	56 48 W	do	7 p., 18	June 18	30.04	SW	SW, 9	SW	SW, 9	Do.
Caledonia, Br.S.S.	Glasgow	New York	55 08 N	21 22 W	June 19	do	June 19	do	NW	do	NW	NW, 8	Steady.
Motocarlina, Belg.M.S.	Aruba	Rotterdam	46 59 N	15 45 W	June 20	2 a., 21	June 22	30.04	NW	NW, 8	NW	NW, 8	Steady.
Darien, Pan.S.S.	Puerto Barrios	Galveston	15 55 N	88 00 W	June 23	3 a., 23	June 23	29.69	SE	SE, 8	SE	SE, 8	Steady.
Persier, Belg.S.S.	Rio de Janeiro	Antwerp	9 04 N	27 20 W	June 25	4 a., 26	June 26	29.86	W	NNW, 7	W	WNW, 7	NNW-W.
Do	do	do	14 56 N	24 52 W	June 27	4 p., 27	June 30	29.92	NNE	NNE, 7	NE	NE, 8	Steady.
Nerissa, Br.S.S.	Demerara	Port of Spain	10 05 N	62 05 W	do	8 p., 27	June 27	29.81	NE	ENE, 8	ESE	ENE, 8	NE-ENE.
Gonzenheim, Ger.S.S.	Cardiff	Newfoundl'd	52 20 N	42 40 W	June 28	8 p., 28	June 29	29.72	S	SW, 8	NW	SW, 8	SW-WSW.
Gulfcrest, Am.S.S.	New York	Las Piedras	13 17 N	69 40 W	June 29	6 a., 29	do	29.10	E	SE, 12	SE	E, 12	NE-E-SE.
Chateau Thierry, U.S. A.T.	Cristobal	San Juan	14 35 N	73 00 W	do	10 p., 29	June 30	29.64	E	SE, 8	E	SE, 8	NNE-SE.
Minnesotan, Am.S.S.	do	New York	16 45 N	75 45 W	June 30	2 p., 30	do	29.78	NE	ENE, 9	ENE	ENE, 9	NE-ENE.
Eastern Sun, Am.S.S.	Los Angeles	Philadelphia	15 50 N	76 10 W	do	3 p., 30	do	29.00	NE	NW, 12	SE	NW, 12	NNW-SW-S.
Mobile City, Am.S.S.	New York	Colon	16 45 N	75 50 W	do	do	do	29.68	E	E, —	S	SE, 9	E-SE-S.
NORTH PACIFIC OCEAN													
Silverguava, Br.M.S.	Manila	Los Angeles	36 15 N	124 42 W	June 2	7 p., June 3	June 3	29.65	SSW	NE, 10	SE	NE, 10	ENE-N.
Fernhill, Nor.M.S.	do	do	26 57 N	130 35 E	do	7 p., 2	do	29.61	SSW	NNE, 8	NE	NNE, 8	SW-W-NNE.
Sangstad, Nor.M.S.	Los Angeles	Yokohama	34 10 N	167 40 E	June 4	7 a., 5	June 7	29.44	SE	SSE	NW	SSE, 8	SSW-W-NW.
Ogura Maru, Jap.M.S.	San Luis, Calif.	do	36 04 N	169 26 E	June 5	4 p., 5	June 5	29.45	SE	S, 6	WSW	SE, 8	SE-S-SW.
Irisbank, Br.M.S.	San Francisco	Manila	23 27 N	137 52 E	June 15	1 p., 15	June 15	29.79	SSW	SW, 8	SW	SW, 8	SSW-SW.
Steel Exporter, Am.S.S.	Hawaiian Islands	Balboa	13 47 N	102 00 W	do	4 a., 15	do	29.65	NE	E, 7	SW	SE, 8	NE-E-SE.
Texas, Am.S.S.	Philippine Islands	San Francisco	33 45 N	151 20 E	June 16	4 a., 17	June 17	29.31	SSE	SSE, 8	W	SW, 8	SE-SW.
Pres. Jackson, Am.S.S.	Honolulu	Yokohama	34 52 N	152 51 E	June 17	5 a., 17	do	29.11	SSE	SSW, 7	NW	S, 8	S-SW.
Hakubasan Maru, Jap.S.S.	Yokohama	Los Angeles	44 23 N	165 52 E	June 19	Noon, 20	June 22	29.32	SSE	SW, 8	W	SW, 8	2 points.
Grays Harbor, Am.S.S.	Philippine Islands	do	39 37 N	174 24 E	June 28	2 p., 28	June 28	29.50	S	SSW, 9	W	SSW, 9	SSW-SW.
Makura, Br.S.S.	Papeete	San Francisco	37 17 N	122 56 W	June 29	4 a., 30	June 30	29.87	NNW	NW, 8	NW	NW, 8	do.

<sup>1</sup> Position approximate.

<sup>2</sup> Barometer uncorrected.

## NORTH PACIFIC OCEAN, JUNE 1933

By WILLIS E. HURD

**Atmospheric pressure.**—The weather over the greater part of the North Pacific Ocean during June 1933 was notably under the dominance of anticyclonic conditions. Several depressions were observed in Far Eastern waters, where the lowest average pressure of the month occurred,

and several appeared over and south of the Aleutians, especially during the early days and a part of the last decade of the month. Many, however, were noted in the Bering Sea, and it was here and over Alaska that the shallow average center (St. Paul 29.90 and Point Barrow 29.88 inches) of low pressure for the extra-tropical region occurred. Departures from the normal pressures over the ocean were mostly small, as may be seen in the table herewith.